

## **SECTION 12 - FUEL SYSTEM**

- The fuel system includes the fuel tank, the fuel pump and the necessary piping to carry the fuel from the tank to the carburetor or injection system.
- All motor fuel tanks attached to the vehicle fuel system must be secured and meet the standards as listed in FMVSS 571-301.
- National Fire Protection Association Pamphlet 52 can be purchased from <http://www.nfpa.org/aboutthecodes/AboutTheCodes.asp?DocNum=52>

### **A. DIESEL / GASOLINE / LPG / NATURAL GAS**

1. Check the fuel tank, fuel tank support straps, filler tube (rubber, plastic, metal), tube clamps, fuel tank vent hoses or tubes, filler housing drain, overflow tube, fuel filler cap and conversion kit installations.

#### **a. REJECT when:**

- 1) There is fuel leakage at any point or escaping gases are detected in the system (Odor will be present).
- 2) The fuel tank filler cap / cover is missing.
- 3) Any part of the system is not securely fastened, supported or shielded to prevent damage from road hazards, slippage, loosening or rotations. (NFPA 52, 6.3)

**SEE NOTE BELOW.**

***\*NOTE: Make sure that the fuel tank is not exposed or unprotected. Tanks that are installed under a vehicle may not be mounted ahead of the front axle or behind the point of attachment of the rear bumper. Tanks shall be protected from physical damage using the vehicle structure, valve protectors or a suitable plastic or metal shield. A tank that is installed in the bed of a truck must be protected with a shield over the top and down any exposed sides. Shields shall be installed in a manner that prevents direct contact between the shield and the fuel tank. The shield shall also prevent the trapping of solid materials or liquids between the shield and tank that could damage the container or its coating. (NFPA 52, 6.3) SEE SHIELD SAMPLES BELOW.***



**Metal Protective Shield Sample**



**Plastic Protective Shield Sample**

## **Fuel System - Continued**

- 4) There is any physical damage to a fuel system component.
- 5) There is any installation hazard present which may cause a potential hazard during a collision.

***\*NOTE: Fuel tanks shall be permitted to be located within, below, or above the driver or passenger compartment, provided all connections to the container(s) are external to, or sealed and vented from, these compartments. All tanks that are installed in the passenger compartment shall be vented to the outside of the vehicle with a boot or heavy plastic bag and shall not exit into a wheel well. Every tank and fuel line shall be mounted and braced away from the exhaust system and supported to minimize vibration and to protect against damage, corrosion, or breakage. No part of the fuel tank or its appurtenances shall protrude beyond the sides or top of any vehicle where the tanks can be struck or punctured. (NFPA 52, 6.3) SEE VENT SAMPLES BELOW.***



**Plastic Bag Vent Sample**



**Plastic Bag Vent Sample**

## Fuel System - Continued

- 6) Vehicle is not labeled in accordance with National Fire Protection Association 52.

***NOTE: Each CNG vehicle shall be identified with a weather-resistant, diamond-shaped label located on an exterior vertical surface or near-vertical surface on the lower right rear of the vehicle (e.g., on the trunk lid of a vehicle so equipped, but not on the bumper of any vehicle) inboard from any other markings. The label shall be a minimum of 4.72 inches long by 3.27 inches high. Where a manual valve is used the valve location shall be accessible and indicated with the words "MANUAL SHUTOFF VALVE". (NFPA 52, 6.11.1) SEE CNG EXTERIOR AND MANUAL SHUTOFF LABEL SAMPLES BELOW.***



CNG manual shut-off label sample



CNG exterior label sample

***NOTE: A vehicle equipped with a CNG fuel system shall bear a label readily visible and located in the engine compartment with identification as a CNG-fueled vehicle, system service pressure, installer's name or company, container retest date(s) or expiration date and the total container water volume in gallons. There shall also be a label located at the fueling connection receptacle with identification as a CNG-fueled vehicle, system working pressure and container retest date(s) or expiration date. If both labels are located in one of the above areas, the labels shall be permitted to be combined into a single label. (NFPA 52, 6.11)***



Engine Compartment Label Sample



Fueling Receptacle Sample

## **Fuel System - Continued**

- 7) A CNG fuel container is not current on its certification in accordance with FMVSS 304. **SEE NOTE AND SAMPLE DISPLAYED BELOW.**

***NOTE: Each CNG fuel container shall be permanently labeled and should be visually inspected after a motor vehicle accident or fire and at least every 36 months or 36,000 miles, whichever ever comes first, for damage and deterioration. (S7.4, FMVSS 304)***

***NOTE: To locate a CNG certified inspector for a tank certification, please refer vehicle owner to: <http://webext.csa.ca/cng/cngmain.asp#searchinspector>***



The image shows a sample of a CNG tank certification label. It is a rectangular label with a blue background and white text. The label is divided into several sections. At the top, it states: "This CNG cylinder must be visually inspected at no less than 36 months from the date marked. DO NOT use cylinder beyond the expiration date marked on the cylinder." Below this, it says: "Cylinder must be reinspected if overpressured, dropped, impacted, reinstalled on a different vehicle, exposed to excessive heat, fire or harsh chemicals, or if the vehicle was in an accident of 5 mph (8 kph) or more." In the center, there is a white box containing the following information: "Label Serial# P - 181540", "Inspection Agency \_\_\_\_\_", and "Inspector Certificate# \_\_\_\_\_". The label is framed by a border of months (JAN, FEB, MAR, APR, MAY, JUN on the left; JUL, AUG, SEP, OCT, NOV, DEC on the right) and years (07, 08, 09, 10, 11, 12 at the bottom).

**CNG tank certification label sample**

***\*NOTE: LPG and LNG leaks may accumulate at ground level. Use extreme caution when around these systems. At no time shall an inspector attempt to conduct maintenance or alterations to any alternative fuel system, unless that inspector is currently certified and trained in alternative fuel conversion installations. Working around these systems is extremely dangerous and requires extensive training.***